

What is claimed is:

1. An optical fiber assembly having a hermetic seal portion for the use of a parallel optical transmission module comprising:

5        an optical fiber assembly including a metal-coated portion where a portion exposed by peeling off resin coating by a prescribed length at a distance from end portions thereof is coated with metal;

         a hermetic connection component having:

             a feedthrough hole which extends from one end of the  
10        component for covering at least a part of the metal-coated portion of the optical fiber assembly;

             a housing groove to be open in an uncovered state which leads to the feedthrough hole and extends to the other end of the component for containing the remainder of the metal coated portion of the optical fiber  
15        assembly; and

             an upward opening formed so as to slant in a direction coming close to the one end of the component at the boundary between the feedthrough hole and the housing groove,

             wherein the component is made of metal and has a length equal  
20        to the sum of the length of the metal-coated portion of the optical fiber assembly plus the required length of the resin-coated portions leading to both sides of the metal-coated portion;

             a brazed portion where at least the metal-coated portion near the upward opening within the feedthrough hole is hermetically sealed to the  
25        hermetic connection component by brazing through the upward opening of the hermetic connection component; and

an adhesive-fixed portion where at least parts of the resin-coated portion as well as the metal-coated portion exposed on the housing groove are fixed with an adhesive to the hermetic connection component.

- 5    2.    The optical fiber assembly having the hermetic seal portion according to claim 1, wherein the feedthrough hole extending from the one end of the hermetic connection component has a length necessary to cover the major part of the metal-coated portion of the optical fiber assembly.
- 10   3.    The optical fiber assembly having the hermetic seal portion according to claim 1, wherein the brazed portion is hermetically sealed by fluxless solder.
- 15   4.    The optical fiber assembly having the hermetic seal portion according to claim 1, wherein the optical fiber assembly is a bundle of ribbon fibers taking at least one of arrangements of piling up the ribbon fibers and of placing the ribbon fibers side by side.
- 20   5.    The optical fiber assembly having the hermetic seal portion according to claim 1, wherein the hermetic connection component comprises a cylinder portion in the shape of a cylinder, a semi-cylinder portion in the shape of a semi-cylinder and a connection portion connecting an edge of the cylinder portion to an edge of the semi-cylinder; the feedthrough hole is formed in the central part along the longitudinal direction of the cylinder  
25   portion and the connection portion; the housing groove is formed in the central part on a plane side along the longitudinal direction of the

semi-cylinder portion; and the upward opening is formed in the central lower part of an oblique face of the connection portion so as to slant in the direction coming close to the cylinder portion.

5 6. A method for manufacturing an optical fiber assembly having a hermetic seal portion by inserting the optical fiber assembly into a feedthrough hole of a hermetic connection component to seal hermetically, wherein the optical fiber assembly includes a metal-coated portion where a portion exposed by peeling off resin coating by a prescribed length at a  
10 distance from end portions thereof is coated with metal, the hermetic connection component has the feedthrough hole which extends from one end of the component for covering at least a part of the metal-coated portion of the optical fiber assembly, a housing groove to be open in an uncovered state which leads to the feedthrough hole and extends to the  
15 other end of the component for containing the remainder of the metal coated portion of the optical fiber assembly, and an upward opening formed so as to slant in a direction coming close to the one end of the component at the boundary between the feedthrough hole and the housing groove, further, the component is made of metal and has a length equal to the sum of the  
20 length of the metal-coated portion of the optical fiber assembly plus the required length of the resin-coated portions leading to both sides of the metal-coated portion, the method comprising the steps of:

positioning the metal-coated portion substantially in the center of the hermetic connection component through inserting the optical fiber  
25 assembly into the feedthrough hole of the hermetic connection component;  
replacing an atmosphere surrounding the hermetic connection

component with an inert gas;

sealing hermetically the metal-coated portion in the feedthrough hole at least near the upward opening to the hermetic connection component by heating the hermetic connection component and by injecting solder into the upward opening; and further

fixing at least parts of the resin-coated portion as well as the metal-coated portion exposed on the housing groove with an adhesive to the hermetic connection component.

7. The method for manufacturing the optical fiber assembly having the hermetic seal portion according to claim 6, wherein an external surrounding of the feedthrough hole is heated in the vicinity of the upward opening of the hermetic connection component during the injection of solder into the upward opening in the inert atmosphere.

8. The method for manufacturing the optical fiber assembly having the hermetic seal portion according to claim 6, wherein the optical fiber assembly is a bundle of ribbon fibers taking at least one of arrangements of piling up the ribbon fibers and of placing the ribbon fibers side by side.

9. An optical fiber assembly having a hermetic seal portion for the use of a parallel optical transmission module comprising:

an optical fiber assembly including a metal-coated portion where a portion exposed by peeling off resin coating by a prescribed length at a distance from end portions thereof is coated with metal;

a hermetic connection component having:

a feedthrough hole divided into a first feedthrough hole which extends from one end of the component for covering at least a part of the metal-coated portion of the optical fiber assembly and a second feedthrough hole which extends from the other end of the component;

5            an housing groove to be open in an uncovered state which leads to the first feedthrough hole and the second feedthrough hole; and

an upward opening formed so as to slant in a direction coming close to the one end of the component at the boundary between the first feedthrough hole and the housing groove,

10           wherein the component is made of metal and has a length equal to the sum of the length of the metal-coated portion of the optical fiber assembly plus the required length of the resin-coated portions leading to both sides of the metal-coated portion, and

a brazed portion where the metal-coated portion at least near the  
15   upward opening within the first feedthrough hole is hermetically sealed to the hermetic connection component by brazing through the upward opening of the hermetic connection component.

10. The optical fiber assembly having the hermetic seal portion according to  
20   claim 9, wherein the first feedthrough hole extending from the one end of the hermetic connection component has the length necessary to cover the major part of the metal-coated portion of the optical fiber assembly.

11. The optical fiber assembly having the hermetic seal portion according to  
25   claim 9, wherein the brazed portion is hermetically sealed by fluxless solder.

12. The optical fiber assembly having the hermetic seal portion according to claim 9, wherein the optical fiber assembly is a bundle of ribbon fibers taking at least one of the arrangements of piling up the ribbon fibers and of  
5 placing the ribbon fibers side by side.

13. The optical fiber assembly having the hermetic seal portion according to claim 9, wherein, the hermetic connection component comprises a first cylinder portion in the shape of a cylinder, a second cylinder portion in the  
10 shape of a cylinder, a semi-cylinder portion in the shape of a semi-cylinder, a first connection portion connecting an edge of the first cylinder portion to one edge of the semi-cylinder and a second connection portion connecting an edge of the second cylinder portion to the other edge of the semi-cylinder; the first feedthrough hole is formed in the central part along  
15 the longitudinal direction of the first cylinder portion and the first connection portion; the second feedthrough hole is formed in the central part along the longitudinal direction of the second cylinder portion and the second connection portion; the housing groove is formed in the central part on a plane side along the longitudinal direction of the semi-cylinder  
20 portion; and the upward opening is formed in the central lower part of an oblique face of the first connection portion so as to slant in the direction coming close to the first cylinder portion.

14. A method for manufacturing an optical fiber assembly having a  
25 hermetic seal portion by inserting the optical fiber assembly into a feedthrough hole of a hermetic connection component to seal hermetically,

wherein the optical fiber assembly includes a metal-coated portion where a portion exposed by peeling off resin coating by a prescribed length at a distance from an end portion thereof is coated with metal, the hermetic connection component has the feedthrough hole divided into a first  
5 feedthrough hole which extends from one end of the component for covering at least a part of the metal-coated portion of the optical fiber assembly and a second feedthrough hole which extends from the other end of the component, an housing groove to be open in an uncovered state which leads to the first feedthrough hole and the second feedthrough hole, and an  
10 upward opening formed so as to slant in a direction coming close to the one end of the component at the boundary between the first feedthrough hole and the housing groove, wherein the component is made of metal and has a length equal to the sum of the length of the metal-coated portion of the optical fiber assembly plus the required length of the resin-coated portions  
15 leading to both sides of the metal-coated portion, the method comprising the steps of:

positioning the metal-coated portion substantially in the center of the hermetic connection component through inserting the optical fiber assembly into the first and second feedthrough holes of the hermetic  
20 connection component;

replacing an atmosphere surrounding the hermetic connection component with an inert gas; and

sealing hermetically the metal-coated portion in the first feedthrough hole at least near the upward opening to the hermetic connection  
25 component by heating the hermetic connection component and by injecting solder into the upward opening.

15. The method for manufacturing the optical fiber assembly having the hermetic seal portion according to claim 14, wherein an external surrounding of the first feedthrough hole is heated in the vicinity of the  
5 upward opening of the hermetic connection component during the injection of solder into the upward opening in the inert atmosphere.

16. The method for manufacturing the optical fiber assembly having the hermetic seal portion according to claim 14, wherein the optical fiber  
10 assembly is a bundle of ribbon fibers taking at least one of the arrangements of piling up the ribbon fibers and of placing the ribbon fibers side by side.